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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,588	12/03/2003	Renato Conta	000280.00034	3437

22907 7590 10/05/2004

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EXAMINER

STEPHENS, JUANITA DIONNE

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/725,588

Applicant(s)

CONTA ET AL.

Examiner

Juanita D. Stephens

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Preliminary Amendment 12/03/2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-16 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-23 is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☒ Claim(s) 2 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 10/169,114.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 17-18 canceled.

Specification

1. The disclosure is objected to because of the following informalities:

On page 2 of the Amendment to the Specification, line 2 after "filed on June 27, 2002, " insert -- now US Patent no. 6,719,913, --.

Appropriate correction is required.

Drawings

2. The drawings are objected to because on Fig. 9 "Sezionne AA" should replaced with --Section AA--.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 2 and 9-11 are objected to because of the following informalities:

In claim 2, line 2 replace "the perimeter" with --a perimeter--.

In claim 9, line 1 replace "claim 2" with --claim 3--. The recitation of "a basin" was first recited in claim 3, not claim 2.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-9, and 11-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Courian Et al.

Courian et al. discloses a thermal ink jet printhead (42)(Fig. 2) comprising: **1)** a reservoir (38) suitable for containing ink, **2)** a die (substrate 60, **3)** a slot (hole 61) etched in said die (col 10, lns 18-36; Fig. 17) and in fluid communication with said reservoir, **4)** a plurality of ejectors, each of which in turn comprises a nozzle (orifice 84) and a chamber (74) having a bottom (portion in which resistor 72 is located (Fig. 7), **5)**

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characterized in that each of said chambers is fluidly connected with said slot through a plurality of elementary ducts (grooves 64) having at least a portion not co-planar with said bottom (reference number 86 on Fig. 7 indicate the direction of ink flow, which clearly shows the groove 64 having a portion not co-planar with the bottom of the chamber), **6)** said chamber is bounded on the perimeter by a continuous wall (Fig. 9), **7)** a basin (basin formed between the edge of barrier layer 62 and the edge of substrate 60, due to the formation of slot etched in substrate) adjacent to said slot and that each of said chambers is fluidly connected with said basin through said plurality of elementary ducts (col 10, Ins 18-36), **8)** said elementary ducts (grooves 64) has a substantially rectangular section (col 7, Ins 66-67), **9)** said substantially rectangular section has a first depth (H64) and a width (W64), and that said width is between 3 and 15 μm (col 7, Ins 63-64), **10)** said chambers comprises a tank (plenum 78) fluidly connected with said plurality of elementary ducts (col 7, Ins 6-9), **11)** said chamber has a second depth (depth is from top of barrier layer to the bottom of barrier layer) independent of said first depth (H64) (Figs. 7 and 10), **12)** said first depth (h64) is between 10 and 100 μm (col 7, In 65), **13)** said basin has a third depth different from said first depth (Fig. 7), **14)** said first depth is between 5 and 20 μm (col 7, In 64), **15)** said die is substituted by a die without a slot (edge feed design of Fig. 6 and 7), and a plurality of chamber is located along at least one side of said die and that each of said chambers is fluidly connected with said reservoir through a plurality of elementary ducts (col 7, Ins 6-10), **16)** a plurality of nozzles (orifice 84) is contained in flat cable (tape 48) having an upper face and a lower face and that a plurality of elementary ducts (grooves

64) is produced on said lower face of said flat cable (col 7, lns 24-26), and **17)** a plurality of chambers is produced on said lower face of said flat cable (Fig. 7).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Courian et al.

Courian et al. discloses a thermal ink jet printhead (42)(Fig. 2) comprising: **1)** a reservoir (38) suitable for containing ink, **2)** a die (substrate 60, **3)** a slot (hole 61) etched in said die (col 10, lns 18-36; Fig. 17) and in fluid communication with said reservoir, **4)** a plurality of ejectors, each of which in turn comprises a nozzle (orifice 84) and a chamber (74) having a bottom (portion in which resistor 72 is located (Fig. 7), **5)** characterized in that each of said chambers is fluidly connected with said slot through a plurality of elementary ducts (grooves 64) having at least a portion not co-planar with said bottom (reference number 86 on Fig. 7 indicate the direction of ink flow, which clearly shows the groove 64 having a portion not co-planar with the bottom of the chamber), **6)** said chamber is bounded on the perimeter by a continuous wall (Fig. 9), **7)** a basin (basin formed between the edge of barrier layer 62 and the edge of substrate 60, due to the formation of slot etched in substrate) adjacent to said slot and that each of said chambers is fluidly connected with said basin through said plurality of

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elementary ducts (col 10, lns 18-36), **8)** said elementary ducts (grooves 64) has a substantially rectangular section (col 7, lns 66-67), **9)** said substantially rectangular section has a first depth (H64) and a width (W64), and that said width is between 3 and 15 um (col 7, lns 63-64), **10)** said chambers comprises a tank (plenum 78) fluidly connected with said plurality of elementary ducts (col 7, lns 6-9), **11)** said chamber has a second depth (depth is from top of barrier layer to the bottom of barrier layer) independent of said first depth (H64) (Figs. 7 and 10), **12)** said first depth (h64) is between 10 and 100 um (col 7, ln 65), **13)** said basin has a third depth different from said first depth (Fig. 7), **14)** said first depth is between 5 and 20 um (col 7, ln 64), **15)** said die is substituted by a die without a slot (edge feed design of Fig. 6 and 7), and a plurality of chamber is located along at least one side of said die and that each of said chambers is fluidly connected with said reservoir through a plurality of elementary ducts (col 7, lns 6-10), **16)** a plurality of nozzles (orifice 84) is contained in flat cable (tape 48) 64) is produces on said lower face of said flat cable (col 7, lns 24-26), and **17)** a plurality of chambers is produced on said lower face of said flat cable (Fig. 7).

Courian et al. at least teaches a basin (formed between the edge of barrier layer 62 and the edge of substrate 60, due to the formation of slot etched in substrate), having a non-specified depth. No patentable weight has been given to the claimed depth of between 20 and 100 um. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a basin with a depth os 20-100 um, since applicant has not disclosed that having the specified depth solves any

stated problem or is for any particular purpose and it appears that the printhead would perform equally well with the basin at any depth.

Allowable Subject Matter

8. Claims 19-23 are allowed.
9. The following is a statement of reasons for the indication of allowable subject matter:

The combination of each of said ejectors presenting a time constant (t), characterized in that each of said chambers is fluidly connected with said slot through a plurality of elementary ducts each having a width (g) determined by means of the formula

$$G = 12 \cdot \eta t$$

Where (η) is the viscosity of the ink and (t) is the time constant assigned to each of said ejectors, and the number N of said elementary ducts is determined by means of the formula

$$N = \frac{(R')^2 \cdot C_m}{4L'}$$

where R' and L' represent respectively the hydraulic resistance and the hydraulic inertance of a single elementary duct, and C_m represents the hydraulic compliance of said meniscus whereby said meniscus presents a critical damping with whatever value is assigned to (t), recited in claim 19. This invention solves the problem of rendering the emission frequency of the droplets of ink maximal by making the time constant (t) of the

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ejector as short as possible, while at the same time satisfying the condition of critical damping of the meniscus, and to filter the ink of any impurities that may be present.

Conclusion

The following US patents listed in the Specification, but not on the PTO-1449 are considered, 5,278,584 and 5,666,143.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juanita D. Stephens whose telephone number is (571) 272-2153. The examiner can normally be reached on Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Juanita D. Stephens
Primary Examiner
Art Unit 2853

JS
9/30/04